



EARTH VENTURE-2

Access to Space

**David B. Jarrett
EV-2 Program Executive
Earth Science Division
Science Mission Directorate**



From the EV-2 AO

This AO is based on SMD's Standard PI-Led Mission AO. Proposers should be aware of the following major changes in this AO from the language in the Standard PI-Led Mission AO Of relevance to the access to space discussion:

- Although NASA-provided launch services are offered and may be proposed, proposers may also propose alternative access to space including contributed launch services.
- NASA-provided launch services may be proposed at a charge of \$50M in FY14 dollars against the PI-Managed Mission Cost.
- Alternative access to space, which must be arranged by the proposer and funded within the PI-Managed Mission Cost, may also be proposed.



Options Allowed in the AO

- At least four possible approaches the PI may propose for access to space:
 1. NASA-provided launch services
 2. Investigations aboard the International Space Station
 3. Non NASA-provided launch services (as primary, secondary, or co-manifested payload on US- or non US-provided launch vehicle)
 4. Hosted payload (on US- or non US-developed carrier)



1. NASA-Provided Launch Services

- Typical approach used on other PI-led AO missions
- NASA-provided launch services may be proposed at a charge of \$50M in FY14 dollars against the PI-Managed Mission Cost.
 - Covers standard services and expects the proposer to cover additional special requirements.
 - Launch delay costs as a result of spacecraft or payload delays are not a standard launch service. Any such delay costs must be funded out of the PI-Managed Mission Cost and, therefore, represent a cost risk to the PI-Managed Mission Cost.
- Mr. Garrett Skrobot, NASA Launch Services Program, is the POC for any questions regarding NASA-provided Launch Vehicle capabilities.

If the EV-2 investigation proposing team requires NASA provided launch services, then the mission will be launched as the primary payload on a single expendable launch vehicle (ELV) that NASA will provide as Government Furnished Equipment (GFE). Standard launch services utilizing a domestic launch vehicle certified as category 3 per NPD 8610.7, *NASA Launch Services Risk Mitigation Policy for NASA-Owned or NASA Sponsored Payloads/Missions*, regardless of the payload classification, will be provided at a \$50M charge to the PI-Managed Mission Cost. There will be an additional charge against the PI-Managed Mission Cost for any launch services beyond the standard launch services offered. Detailed information on launch vehicle performance options, including a description of standard launch services and the nominal costs for nonstandard services, is provided in the *ELV Launch Services Information Summary* document in the EV-2 Library.



2. International Space Station Investigations

- Investigations to be flown aboard the ISS may be proposed
- NASA will provide accommodations on the ISS, as well as transportation to the ISS
 - These costs will not be levied against the PI-Managed Mission Cost
 - Investigations may be proposed for periods of on-orbit performance of up to five years within the funding cap; however, mission performance requirements must be met prior to the nominal end of ISS operations in 2020
- Mr. George Nelson, ISS Payloads Office, is the POC for any questions regarding ISS capabilities.

Investigations requiring flight on the ISS must provide a Letter of Feasibility from the NASA Space Station Payloads Office. This Letter of Feasibility must contain: (1) a preliminary assessment of the feasibility for proposed provisions for access to and accommodation on the space station, (2) identification of known challenges and/or conditional provisions for access or accommodation, and (3) a description of the level of technical interchange and negotiation required to mature the proposed provisions for access and accommodation. For any selected investigations, flight commitment to the ISS will be negotiated with NASA's Space Operations Mission Directorate during Phase A. Selection of any investigation to be flown aboard the ISS is conditional until negotiations for ISS access and accommodation are successfully completed.



3. Non NASA Launch Services (1 of 2)

Alternative access to space, rather than the use of NASA-provided launch services, may be proposed or considered under this AO. Alternative access to space may include non-NASA launch services as primary, secondary, or co-manifested payloads on a U.S. or non-U.S. launch vehicle.

The proposed investigation must be a complete Earth science investigation and the PI must remain in charge of the development, launch, and successful operation of the EV-2 mission.

- This terminology is intentionally designed to allow the proposer to devise their own approach to launch, including working directly with Launch Vehicle providers outside of the NASA LSP NLS II contract mechanism
 - Allows the Proposer to purchase a U.S. launch vehicle outside of NASA LSP and NLS II contract
 - Allows the Proposer the use of a non-U.S. launch vehicle with certain restrictions
 - Contributed launch services must be provided on a no-exchange-of-funds basis and **must** be part of a legitimate scientific collaboration.
- This will allow for possibly innovative Science Instruments + Spacecraft + Launch Vehicle proposals



3. Non NASA Launch Services (2 of 2)

- Proposal must be consistent with national law and NASA policy
- Insight/Oversight role of NASA Launch Services Program (LSP) is defined by NASA policy and delineated during Phase A activities
 - A charge to the PI cost cap of \$2.0M will be levied for the expected NASA LSP monitoring activities.

Proposals that include non-NASA launch services obtained from/provided by a U.S. or non-U.S. partner shall meet the following requirements:

- The proposer must secure the organization(s) that will provide launch services.
- The proposal must identify the launch opportunity and must provide evidence in the proposal that the launch service provider agrees to manifest the EV-2 mission should the proposal be selected and confirmed for flight by NASA.
- The proposal must describe the approach for NASA's insight for launch services.

Purchased launch services must be obtained on a U.S.-manufactured launch vehicle only. U.S. Space Transportation Policy prescribes the use of U.S.-manufactured launch vehicles for the launch of U.S. Government-sponsored payloads.

Contributed launch services may be obtained on a U.S.- or foreign-manufactured launch vehicle; contributed launch services must be provided on a no-exchange-of-funds basis and be part of a legitimate scientific collaboration.



4. Hosted Payloads (1 of 2)

- Alternative access to space may include payload accommodations as a hosted payload (e.g., instrument package) on a U.S.- or foreign-provided carrier.
- The proposed investigation must be a complete Earth science investigation and the PI must remain in charge of the development, launch, and successful operation of the EV-2 mission.
- Proposer must do all the negotiating to secure the ride.
- The partnership must be established in the proposal and partners must provide evidence of their commitment (e.g., Letter of Commitment) in the proposal
- Stability of the partnership and the commitment is an evaluation criterion.
- Insight/Oversight still set by NASA policy

Proposals that include payload accommodation as a hosted payload on a U.S. or foreign provided carrier shall meet the following requirements:

- The proposer must secure the organization(s) that will provide the payload accommodations.
- The proposal must identify the mission opportunity and must provide evidence in the proposal that the mission provider agrees to manifest the EV-2 investigation should the proposal be selected and confirmed for flight by NASA.
- The proposed EV-2 investigation must be self-sufficient and the success of the EV-2 investigation must not depend on the other science payloads accommodated on the partner-provided platform. The NASA PI is responsible for the entire EV-2 investigation including mission assurance. The proposal shall describe how mission assurance will be met for those areas that are not under the PI's control.



4. Hosted Payloads (2 of 2)

- Purchased payload accommodations must be obtained on a U.S.-manufactured carrier.
- Contributed payload accommodations may be obtained on a U.S.-manufactured carrier on a no-exchange-of-funds basis.
- Contributed payload accommodations may be obtained on a foreign-manufactured carrier on a no-exchange-of-funds basis and must be part of a legitimate scientific collaboration.
- A charge to the PI cost cap of \$2.0M will be levied for the expected NASA LSP monitoring activities for payload accommodations launched on a non NASA-provided launch vehicle.



NASA Launch Services Program's Monitoring Role for non NASA-provided Launch Vehicles

- The LSP monitoring role will be done through an established process that has been employed on previous NASA missions
 - GPM with the HII and JAXA
 - LADEE with the Minotaur and the Air Force
- Mr. Garrett Skrobot, NASA Launch Services Program, is the POC for any questions regarding LSP Advisory Services.

Non-NASA launch services will be handled by NASA consistent with existing policy and regulations. The demonstrated reliability and the resultant probability of mission success for contributed launch services will be evaluated by NASA consistent with U.S. Space Transportation Policy (see Section 5A) and NASA's Launch Services Risk Mitigation Policy (NPD 8610.7D, *NASA Launch Services Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads/Missions*). The proposed launch service will be assessed in conjunction with NASA stakeholders as part of the selection process. The NASA Flight Planning Board will approve final mission assignment assuring consistency with Agency risk strategy. Information on the reliability of ELVs may be obtained from the point of contact listed in the *Launch Services Information Summary* document.



Access to Space

A large, faded image of the Earth from space, showing the Americas, serves as a background for the central text.

QUESTIONS?